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SUPERFUND REMEDIAL BRANCH

REMEDIAL ACTION MANAGEMENT PLAN

REMOVAL OF ASBESTOS COVERED PIPE

BUNKER HILL SUPERFUND SITE

Submitted by:

BUNKER LIMITED PARTNERSHIP
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Prepared by:
D
D

November 7, 1994

Approval is only
to continue to next
WP phase
• Deliverable
Schedule

• Any local
Contractors
that could do this?

• Armin's Review
of submittals

• Bill's review -
State

Disposed
areas
O.K.?

REMEDIAL ACTION MANAGEMENT PLAN

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1.0 PROJECT DESCRIPTION

1.1 Site History and Physical Description. The Bunker Hill Mine operated from 1895 until 1981 and then was reopened in 1988. The adjacent lead smelter and zinc plant complex operated from 1916 until 1981. The Bunker Hill operation grew to a maximum milling capacity of 2,500 tons of ore per day, typically employed approximately 2,000 people, and produced one-fifth of the refined lead, zinc, and silver in the U.S. Facility activities stopped in 1981 from the combined effects of lower market prices and increased operations costs.

The Bunker Hill Site consists of approximately 21 square miles of land.

The Zinc Plant area, contains the former Bunker Hill Electrolytic Zinc Plant, and covers approximately 60 acres. Major operations in the area included concentrate handling and pretreatment, roasting, leaching, electrolytic recovery of zinc, sulfuric acid manufacturing, and electrolytic cadmium recovery. The Zinc Plant has not operated since closure in 1981; however salvaging operations continued periodically in this area after closure, but were stopped in 1989 in response to an EPA administrative order (EPA, 1989). Much of the major equipment has been removed, along with some material accumulations. The Zinc Plant is located slightly more than 1 mile south of the mouth of Government Gulch. The Zinc Plant facilities are located on the floor of the gulch, as well as on the eastern hillside above the gulch floor. The Old Cottrell and new Zinc Plant stack are located in the northeast corner of this area on a hillside overlooking the Zinc Plant.

The Lead Smelter area contains the former Bunker Hill Lead Smelter and covers approximately 59 acres. Major operations in the area included blending and pelletizing of concentrates, sintering, smelting, and refining of lead and trace elements, and sulfuric acid production. The smelter has not operated since closure in 1981; however, salvaging operations have continued periodically in this area since closure. Much of the major equipment has been removed along with some buildings, building materials, and material piles. The lead smelter is situated on a hillside that slopes gently to the north. A prominent feature in this area is the new Smelter stack which was built in 1977 and which towers several hundred feet above the rest of the area.

1.2 Summary of Work. This site is a hazardous waste site as identified on the National Priorities List. This listing was established pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and National Contingency Plan. The site is located inside a secured area within the Bunker Hill complex. All work will utilize trained hazardous waste site workers and be in compliance with an approved Site Safety Plan. In general, the work consists of:

1. Training locally hired employees to perform asbestos work.
2. Sampling and analysis of suspect asbestos containing materials for asbestos content and suspect paint materials for lead content.
3. Preparation/revision of the Work Plan and Health and Safety Plan.
4. Removal of the asbestos pipe and disposal on-site in the Asbestos Laydown Area. *asbestos or pipe & asbestos?*
5. Removal of the pipe stands and concrete supports, with disposal on-site in the Central Impoundment Area (CIA).
6. Preparatory site work and subsequent restoration required to provide access and perform the asbestos abatement work.

2.0 PROJECT MANAGEMENT

2.1 Management Strategy. The objectives for the contract are to apply the necessary resources to the project site to ensure effective and efficient performance of the work. The Contractor will be assigned overall project responsibility and will make all preparations to field the project and retain contract responsibility for the project duration. As the project translates to the field, the Contractor's office staff will shift to an oversight role. Once the project is fielded and to the extent possible, beyond initial project set-up, administration and management will occur in the field.

Who prepared this report?

2.2 Organization Structure. In response to the project demands, the proposed project team will be organized as detailed in Attachment 1. Further discussions will categorize the organization into two (2) general groups: The Contractor's Office and Staff; and the Field Operations.

Attachment I ?

2.2.1 Contractor's Office and Staff. The Contractor's Office and Staff as supplemented by subcontractors will provide project support through its full time staff. This staff will perform the functions of the Project Manager, Contract Administration, and Staff Engineers. The full time staff will provide contract level management, project oversight, contract administration, and technical support. Project support involves three phases: start-up, sustaining, and close-out. The Contractor's office staff involvement during these phases varies from a high level during start-up (planning and preparation) to low level during oversight (sustaining) after the project has been fielded. Involvement will intensify as the project closes out. This team also relies upon integration of subcontractors performing various aspects of health and safety, hazard assessment and quality control functions.

Who is the Contractor ?

Start-up:

Planning began with the estimate preparation for the project. Initial project planning and Work Plan development will ensure a thorough understanding of the project and a feasible estimate approach are generated. The Project Manager will be assisted as necessary by estimators, staff engineers, and the field management team, through planning sessions. Initial project requirements such as work plans, staffing, documentation formats, budget, schedule, submittals, Health and Safety Plan, material procurement/purchase agreements, subcontracts, and Quality Control Plan will be assembled. Once the Work Plan is developed, the Project Superintendent will carry the package to the field.

This is the WP = (Bent 4.0)

Sustaining:

The Contractor's Office involvement should decrease dramatically during this phase of the project. The office will receive, review, track, and distribute field generated administrative products and documentation originating from the project field office. With the bulk of the project management responsibilities handled at the project level, the Project Manager will be available to assist the project on an as-needed or exception basis and will provide project oversight, accomplish contract planning and scheduling, and perform change of project scope estimate validation. Project oversight will also occur through regular attendance of scheduled project (field) review meetings by the Project Manager, periodic site visits, and review of daily reports, quality control reports, schedule, correspondence, site generated plans, and submittals.

OS personnel? resume/CO?

Project Close-Out:

The Contractor's Office involvement in the project will increase slightly as involvement shifts from sustaining/oversight to project close-out. Reports will be generated and project records will be finalized and stored. The Project Manager manages the close-out of subcontracts, purchase agreements, and accounts payable. The Project Manager will ensure the generation of project close-out reports and review as-built documents.

2.2.2 Field Operations. The key to effective field operations, and the consequent minimization of construction costs, is the development and implementation of quality work plans. The Work Plan is developed in the Contractor's Office by a team composed of Office and Field personnel. The Work Plan must then undergo transition to the field and execution; the two phases of field operations.

*Isn't this
the WP?*

Transition Phase:

Smooth transition from the planning (start-up) phase to the execution phase is accomplished by the Project Superintendent through his involvement in the original proposal preparation, planning, work plan development. This transition involves setting up the field office and other support facilities, crewing, and equipping the project and fitting the work plan/ design to the actual site conditions.

Execution Phase:

On-site project management personnel (Project Superintendent, Project Engineer, Task Foreman, Administrative Assistant, Site Safety Officer) will have the skills and authority necessary to perform all normal administrative and technical functions required to implement and accomplish the project tasks.

2.3 Duties, Responsibilities, and Authority. The task management requirements and assignments are detailed in Section 2.4, Management Plan. In summary, these include:

2.3.1 Project Manager

Duties and Responsibilities: Overall project management and contract administration.

Authority: Authorized signatory and representative for Contractor regarding contract, pay estimates, contract modifications, and all other contractual documents, without monetary limitations.

2.3.2 Project Superintendent/Project Engineer

Duties and Responsibilities: Direct field operations and provide on-site daily project oversight and management. Responsible for project performance, crewing, scheduling, monitoring and quality control. Provide requisite reports and documentation; serves as alternate Site Safety Officer; serves as QC Coordinator, prepares progress estimates and supporting information, including schedules, reports and narratives; and manages subcontracts.

Authority: Authorized to commit company resources (such as labor, equipment, and materials) without limitation and to execute contract modifications not to exceed \$25,000.00 in monetary value.

2.3.3 Health and Safety Manager

Duties and Responsibilities: Implementation and administration of corporate health and safety programs, respiratory protection programs, federal and state regulatory programs, and overall responsibility for the development and implementation of Site Specific Health and Safety Plan.

Authority: Stop work authority in the event of unsafe work practices.

2.3.4 Site Safety Officer

Duties and Responsibilities: The site safety officer will be present on-site during the conduct of all field operations and will be responsible for all health and safety activities and the delegation of duties to the Health and Safety Staff in the field.

Authority: Stop work authority in the event of unsafe work practices.

2.4 Management Plan. This management plan details specific subtasks to be accomplished for the project. These subtasks are defined and subsequent responsibility is assigned to project personnel based on project staffing. The intent is to place only those management resources in the field required to supervise, perform and document the work. The following section provides suggested contractor methods for accomplishing subtasks/areas of responsibility.

2.4.1 Project Controls

Performance

In all cases, the Project Superintendent is responsible for project performance. Performance simply means managing the project in a manner that produces the desired results within schedule and at or below budget. The Project Superintendent meets this criteria by thoroughly understanding the project requirements, drawings and specifications. The Project Superintendent then works with the project and staff engineers to plan definable work subtasks, a logical sequence for execution of those subtasks and work crews, materials and equipment to meet those subtasks in an efficient and economical manner. During remediation activity, the Project Superintendent directs foremen, monitors progress and assures resources are in place to perform subsequent scheduled subtasks.

Specification Compliance.

The Project Superintendent is responsible for meeting project specifications, drawings, work plans and associated requirements. Compliance is maintained through the Project Superintendent's use of the project team and implementation of quality control measures. Staff and project engineers assist the Project Superintendent in drawing and specification reviews where project requirements are determined and construction methods are developed to meet those requirements. Quality assurance through process control and verification testing as developed in the Quality Control Program are then built into the work plans. Documentation of methods and quality control procedures are maintained in field notebooks, standard record forms and daily reports.

Project Schedule

The Contractor will maintain a critical path (master) schedule compatible with the specified requirements. The schedule will be updated monthly from the short interval schedules, below, or as significant changes occur. The schedule will be plotted in large scale format and posted in the construction trailer. This schedule will be used as the master and updated by hand prior to updates of the computer model. Letter sized copies of updated schedules will be made and distributed at the project meetings. All schedule changes will be made through the Project Superintendent on his/her short interval schedule to insure incorporation into the master schedule.

Short Interval Schedule

The Project Superintendent maintains a two-week, short interval schedule projecting subtask time frames, sequences and resource requirements. This schedule is used for daily operations by the Project Superintendent and Foreman and for updating the master schedule by the Project Engineer. Actual progress is recorded on the form which then serves as an "actual" (as-built) versus "planned" record of project progress. The Project Superintendent uses the schedule to provide feedback to foremen on actual versus planned progress and allows daily updating of future resource requirements. The Project Superintendent reaccomplishes the schedule weekly so that the second week on the form (and subtask

planning) always provides a one-week look ahead. A copy of the short interval schedule, both as- forecast and as-built will be provided during the weekly project meetings.

Cost Tracking

Cost tracking is the responsibility of the Project Superintendent, generally accomplished by the Project Engineer. Costs type are assigned to work accounts (items) in the field. This coding matches the budgeted work breakdown structure, Section 5.0 of this document.

Production and Quantity Tracking

Daily production will be documented in a bound logbook by the Foreman in charge of the subtask. The production data will be transcribed by the Project Engineer onto log sheets specific to each production item. These forms will be maintained in labeled sections of a notebook labeled "Production Records". Detailed records of quantities will be maintained in accordance with the project requirements. Such details may include excavated quantities by hot spot number (location), quantities transported off-site, quantities transported to stockpile by stockpile number, sample number, volume of groundwater pumped, etc.

Subcontracts

Potential subcontractors will be identified during the estimating phase of the project. Subcontractors will be provided all applicable portions of the specifications and drawings along with other requirements (drug-free workplace, equal opportunity employer, health and safety requirements, etc.). Contract Administration will prepare and execute subcontracts and assure that insurance requirements have been met. An "Intent to Subcontract Letter" detailing specific requirements for subcontracting under the contract, along with a proposed subcontract, will be sent to the prospective subcontractor. A copy of the executed subcontract will be maintained at the project site and the original will be forwarded to the Project Manager. The project Superintendent will review each subcontractor's safety program and verify compliance with OSHA required health and safety training and medical surveillance program at that meeting. Subcontractor pay estimates will be prepared by the Project Superintendent or Project Engineer, coordinated with the subcontractor's representative, approved by the Project Superintendent and forwarded to the Project Manager for payment on a schedule and basis determined by the subcontract.

→ & provided
to EPA (next
to main
plan)

Work Plans

The Project Superintendent is responsible for following the work plans associated with the project. Work Plans will not be a reiteration of specification and drawing requirements, but will be specific and concise plans arranged in a logical sequence for efficient execution of the work to meet the specification and drawing requirements. Work plans will address process techniques and equipment selected, work constraints imposed by health and safety, environmental protection, and specific procedures to accomplish the work. Deviations from the work plans will be documented in the daily reports and major deviations will require revision of the Work Plan. The Work Plan will be maintained at the project site and will become a permanent project record.

2.4.2 Crewing

Project crewing is the responsibility of the Project Superintendent. Crewing will be based on factors of health and safety, specification compliance and project performance as described above. Crewing requirements will be projected on the master schedule for the entire duration of the project and will be updated weekly by the Project superintendent using the short interval schedule. Perspective employees must pass a drug screen, be certified as physically able to work on a hazardous waste site by an approved occupational medical physician, possess or acquire required OSHA Health and Safety Training, AHERA asbestos worker training or AHERA Contractor/Supervisor training.

2.4.3 Management of the Work

Work Activities

Construction related subtasks will be managed by Foremen. The Foreman in charge of a construction subtask will be responsible for execution of the subtask in accordance with the work plans, specifications and drawings, health and safety plan and other applicable plans and requirements. In the absence of a subtask Foreman, the Project Superintendent will be responsible for subtask management. The Foreman will immediately notify the Project Superintendent if deviations in the work plans are required or if the requirements of specifications, drawings or plans are not being met. The Foreman will record significant events, plan and schedule deviations, weather conditions and start and stop times as a daily entry in his/her bound log book. In addition, the Foreman will record personnel and equipment hours, materials used and production quantities in their log book. These notebooks will be turned in to the Project Superintendent at the end of the shift for incorporation into the daily report and will be returned to the Foreman at the next start of shift.

Equipment

The Project Superintendent is responsible for the selection, use and maintenance of all equipment utilized on the project. Equipment selection will be based on the most cost-effective scheme, that considers the physical requirements to perform the subtasks, operating costs, mobilization costs and the ability of each piece of equipment to perform multiple subtasks throughout the project duration. The Project Superintendent will make evaluations, determine equipment requirements and availability, and schedule equipment with consideration of required lead times.

2.4.4 Contract Administration

Progress Payment Preparation

Progress payment estimates will be prepared monthly by the Project Engineer. The estimate will provide quantity to date information sufficient to establish the value of completed work. The estimate will also contain entries for materials on hand (detailed on separate sheet) and change orders. Completed Progress Estimates will be signed by the Project Superintendent and forwarded to the Program Manager via Letter of Transmittal. Clean copies will be forwarded to Accounts Receivable. The pay estimate will be coordinated with the on-site representative.

2.4.5 Internal and External Communications

- Daily Safety Meetings will be held each morning during field activities to pass information to the work crews regarding expected field conditions, work requirements, related safety issues and other project specific information. Crew feedback is encouraged at these meetings.
- Log Books are maintained by all Field Managers, Foremen and Health and Safety Technicians. These are used to document production, incidents, weather and other significant field information. These log books act as an information resource for the Project Superintendent and Project engineer who review them daily.
- Daily Reports are generated by the Project Engineer and reviewed by the Project Superintendent which summarize information from the log books and other sources and includes quality control activities planned and performed. The reports record the weather and site conditions, nature and quantity of work and the results of tests and monitoring.

- Scheduled Daily Meetings between the Project superintendent and the on-site representative are encouraged to facilitate timely communication of project status, quality control and planned activities.
- Weekly Update Meetings between the Bunker Limited Partnership and Contractor's project level personnel are also encouraged to communicate project status and to assure the expectations for the project(s) are being met.

2.4.6 Approach for Resolving Problems on Tasks

The general policy for problem resolution is to deal with the problem at the lowest possible level, where the individual's knowledge and responsibility level allow an effective decision to be made. Significant problems, not readily resolved, will require the Project Superintendent with support from the Program Manager and staff engineers to act as a focal and decision point.

The Project Superintendent will make determinations on problems that are within his capabilities to solve. A problem-solving process based on Total Quality Management principals will be employed. Steps in this process are: problem definition, problem analysis, generation of potential solutions, selection and planning of solution, solution implementation, and solution evaluation. If the problem is not resolvable within the project staff, then the Project Manager will be involved. Current problems and their status (step in the problem solving process) will be discussed during the weekly review meetings and noted in the daily reports.

3.0 PERSONNEL MANAGEMENT

3.1 **General.** Identification, hiring, and programs for personnel involve incorporating personnel into the Contractor's employee programs and are consistent with established hiring practices.

3.2 **Hiring Practices and Qualifications.** Local hire will be the preferred option. Personnel must have prior 29 CFR 1910.120 training for hazardous waste site work, all other training will be provided. Pre-employment drug screening and medical examination will be a condition of employment. ★

3.3 **Training.** The contractor will provide a comprehensive (32 hour) asbestos worker training course that satisfies the requirements of the Toxic Substances Control Act, Title II (EPA Model Accreditation Plan, 40 CFR 763 subpart E, Appendix C), OSHA requirements and 29 CFR 1910.1001 for asbestos workers. An additional 8 hours of training will be performed for supervisory personnel. NESHAP?
ASHERA?

3.4 **Medical Surveillance.** The medical surveillance protocol to be implemented is the Contractor's Occupational Physicians responsibility, but shall meet the requirements of ANSI 788.2 (1980). The medical surveillance protocol shall, as a minimum, cover the following:

- Medical and Occupational History
- General physical examination (including evaluation of major organ system)
- Biological Blood Profile (SMAC-21 or equivalent)
- CBC
- Current Tetanus Inoculation
- Chest x-rays (performed no more frequently than every four years, except when indicated otherwise)
- Pulmonary Function Testing (FVC and FEV 1.0)
- Ability to Wear Respirator
- Visual Acuity
- Audio Metric Testing

4.0 WORK PLAN

4.1 General. This section details the work activities, abatement techniques and project approach to performance of the contemplated work. The processes described include anticipated equipment and personnel requirements for site preparation, abatement and disposal of the asbestos covered pipe. The discussions of methods incorporate the health and safety considerations, quality control and testing program and general abatement requirements. The Work Plan subdivides the project into four phases: project set-up and site preparation; pre-abatement; abatement; and close-out and restoration. The Work Plan relies upon the Project Schedule Section 5.0 to show interrelationships of the activities. Health and Safety, Section 6, and Quality Control, Section 7, requirements are detailed for the unique aspects of the work scope. Section 6, Health and Safety, is considered a supplement to the Contractor's site specific Health and Safety Plan.

4.2 Project Setup and Site Preparation

4.2.1 Support Area/Temporary Facilities. The support area will be located inside the east access gate on McKinley Avenue. Temporary facilities will include office trailer and decontamination facility with requisite utility and telephone connections. Project signs will be provided and communication systems, both phone and radio, will be established. A project safety board will be provided.

4.2.2 Construction of Access Road

4.2.2.1 Task. The Contractor will construct an access road or improve the existing road adjacent to the asbestos covered pipe. The access road will be used to support man lifts and cranes for safe cutting and removal of the pipe. The road will run the entire length of the pipe and will be a minimum of 12 foot wide. The roadway will also serve as access for disposal trucks. All haul routes will require water application for dust control. Road construction will be performed in Level C protection until ambient air monitoring for dust and personnel monitoring for lead indicates that it is safe to downgrade to Level D protection.

4.2.2.2 Equipment

- D8 Bulldozer
- 10 Ton Vibratory Roller
- 14 Grader
- Water Truck
- Man Lifts
- Generator
- Decontamination Trailer
- HEPA Vacuums

4.2.3 Disposal Site Preparation. The Asbestos Laydown Area will be prepared to receive asbestos pipe by excavating and shaping a small pit. The soil removed during grading will eventually be used to cover the asbestos pipe. A twelve (12) inch bedding of slag will be prepared within the disposal site to receive the pipe.

AU level D
shall ~~construct~~
of additionally
include
coveralls.

Amma - enuf / too much?

4.3 Pre-Abatement

4.3.1 General. This phase involves delineation of the EZ/CR and installation of the health and safety facilities. This work generally occurs in "clean" areas. This phase also includes material testing and data collection required to formalize the work plan.

4.3.2 Health and Safety Facilities and Features. The EZ and CRZ required delineation to be established by a four (4) foot high plastic safety fence with appropriate signage at the perimeter of each zone in accordance with the SSHP. Air monitoring stations and wind indicators will be erected at the site. Existing decontamination (both equipment and personnel) facilities will be utilized for this project. Personnel gross decontamination stations are portable and will be positioned to service the EZ entry point. Personnel decontamination stations and support area all require first aid kits, eye wash station, fire extinguishers and an emergency air horn.

*- E. McNelly
demob
for winter?*

4.3.3 Sampling and Analysis. The Contractor will obtain a total of ten (10) samples of suspected asbestos containing materials from the pipe. One sample will be taken from each end of the pipe, three (3) samples obtained from even spacing along the pipe, and five (5) samples from the joints, bends and other connections. The ten samples will be analyzed for the type and percent asbestos content utilizing EPA method 600/R-93/116 for bulk building materials. This data will be used for finalization of the work plan.

*Armona?
1 sample for
each
constitute
asb. survey?*

In addition to analyzing for asbestos content, the Contractor will obtain five (5) paint samples from the pipe support stands and appurtenances. The paint samples will be analyzed for lead concentration using EPA method 7421. If the samples indicate that lead is present, then the samples will be run for toxic leach characteristic procedure (TCLP) lead by EPA method 1311/7421. This data will determine whether the pipe stands will be disposed on-site as lead contaminated material. This Work Plan assumes the pipe stands do not have

lead paint present, but will be modified, if necessary, after sample analyses.

In the event that physical degradation of the underground ACM piping is observed, the soil directly below the damaged area of the steam line will be tested for asbestos after the abatement of the piping and all visible debris is completed. A representative number of soil samples will be collected and analyzed for asbestos content utilizing Polarized Light Microscopy (PLM) methodology. Soil results shall be considered non-contaminated if the total volume of asbestos in the sample is 1 percent or less. In areas where the results of the soil samples are greater than 1 percent by volume; additional soil will be abated and the area resampled. This procedure will continue until the results of the soil tests are all 1 percent or less ACM by volume as determined by a NVLAP accredited laboratory.

4.4 Abatement

4.4.1 General. Abatement activities include all operations associated with containment, removal, transporting, and disposal of the asbestos covered pipe and associated support stands and concrete.

4.4.2 Asbestos Abatement - Above Ground Pipe

4.4.2.1 Task. The Contractor will procure all permits necessary prior to beginning asbestos abatement. When all permits are in place, the pipe will be removed by beginning at the east end of the pipe and proceeding to the west. Prior to removal at each individual pipe support stand, the asbestos material will be removed utilizing negative pressure glove bag methodology to an approximate length of three (3) linear feet. The exposed ends of asbestos materials within the glove bag will be sealed with dip lag, and scrim cloth before removal of the glove bag system. The glove bag will be placed directly into a

*Armona -
do we need
permits for
stand
activity?*

second polyethylene disposal bag and properly sealed for transport to disposal area. The Contractor will also repair all damaged areas with lagging prior to pipe removal. After the pipe hanger areas are abated at the support stands, and repairs are made to portions of the pipe with disrupted asbestos, the Contractor will cut the pipe and insert a pre-fabricated metal pin inside the steel pipe to support the pipe during subsequent cutting, containing and lifting of the subject section. With the metal pipe firmly supported by the interior pipe hook, the next support area will be cut to free the pipe. The pipe will then be thoroughly wetted, covered with two layers of 6 mil polyethylene sheeting and taped to the metal pipe at both abated ends with duct tape. The contained sections of piping will be loaded onto a flatbed trailer for transport to the designated on site asbestos lay down area. Personnel air monitoring and work zone air monitoring will be performed continuously in accordance with Section 6.0 (Health and Safety).

4.4.2.2 Equipment

- Crane
- Man Lifts
- Pipe Saw
- Cutting Torch
- Flat-Bed Tractor Trailer
- Forklift with Slings
- Water Truck
- 850 Dozer
- Generator
- Decontamination Trailer
- HEPA Vacuums

4.4.3 Asbestos Abatement - Below Ground Pipe

4.4.3.1 Task. The Contractor will excavate the asbestos covered pipe utilizing a trackhoe with smooth lip bucket to carefully expose the top of the buried pipe. The excavator will remain a safe distance from the pipe to avoid disturbing the ACM. Hand excavation will be used to minimize potential damage to the ACM during the remainder of the excavation. Once the pipe is exposed a parallel, and offset deeper trench will be excavated to an elevation below the bottom of the pipe. The Contractor will then follow the prescribed glove bag methodology as described in section 4.4.2.1. The glove bag will be placed directly into a second polyethylene disposal bag and properly sealed for transport to the disposal area. After the pipe hanger area are abated at the support stands, the Contractor will utilize a pre-fabricated metal pin to slide inside the steel pipe to support the pipe during the cutting process. With the metal pipe firmly supported, the next support area will be cut to free the pipe. The pipe will then be thoroughly wetted, then covered with two layers of 6 mil polyethylene sheeting, and taped to the metal pipe at both abated ends with duct tape. The contained sections of piping will be loaded onto an flatbed trailer for transport to the designated on site asbestos lay down area. Personnel air monitoring and work zone air monitoring will be performed in accordance with Section 6.0 (Health and Safety).

4.4.3.2 Equipment

- Crane
- Man Lifts
- Pipe Saw
- Cutting Torch
- Flat-Bed Tractor Trailer
- Forklift with Slings
- Water Truck
- 850 Dozer
- Cat 235

4.4.4 Asbestos Landfill Maintenance and Cover

4.4.4.1 Task. The asbestos pipe will be delivered to the designated Asbestos Laydown Area (ALA). An area in the ALA will be prepared by creating an adequate size trench. The trench area will be sufficiently bermed to minimize the potential disturbance of the asbestos materials by heavy equipment operation in the area. The asbestos pipe will be placed in lifts of one pipe depth. Between lifts and after disposing of the asbestos pipe in the ALA, the Contractor will place slag material over the asbestos pipe. A six (6) inch cover between lifts and a twelve (12) inch cover of slag over the final lift will be graded and compacted to prevent unwanted intrusion into the asbestos material. The placement of slag over the asbestos pipe will occur throughout the project duration. The asbestos material will also be maintained in a sufficiently wet condition until such time that the ACM is completely covered. At the completion of each day's asbestos pipe removal, slag will be placed over the pipe for physical and weather protection. At project completion, the soil from the initial grading of the waste pit will then be placed over the top of the slag to a minimum depth of 24 inches in the limits of the disposal area.

4.4.4.2 Considerations

- Asbestos material will be covered every night.
- All haul routes for fill will require water application for dust control.
- Grade surrounding area of asbestos landfill to divert water around the asbestos area.

4.4.5 Pipe Stand Removal and Salvage

4.4.5.1 Task. Following removal of the asbestos pipe, the steel support stands will be removed and disposed in the CIA. This assumes the pipe stands do not contain lead paint or asbestos. If required, the pipe stands will be cut at the base where they are bolted to concrete supports using a cutting torch.

4.4.5.2 Considerations

- All cutting torch activities will be performed in Level C protection, with leather chaps worn over the Tyvek suit.

- All haul routes will require water application for dust control.

4.4.5.3 Equipment

- Flatbed Trailer
- 235 Excavator
- Cutting Torch
- Pressure Washer
- Front-End Loader

4.4.6 Concrete Support Removal

4.4.6.1 Task. After or as part of removing the pipe support stands, the Contractor will excavate and remove the concrete support stands. The concrete will be hauled to the East Cell of the CIA and disposed adjacent to the existing debris. The excavated area surrounding the concrete support will be filled with material in the immediate area and rough graded with the bucket of the excavator.

CIA disposal
?-Tom?

4.4.6.2 Considerations

- The excavation will occur in Level C protection unless air monitoring results indicate it is safe to downgrade to Level D protection.
- All haul routes will require water application for dust control.

*

4.4.6.3 Equipment

- 235 Excavator
- End Dump Truck
- Water Truck

Tom
Mike
B&D
Arma

4.5 Close-Out and Restoration

4.5.1 General. This phase involves the work after asbestos abatement is complete. The activities include equipment and facility decontamination, general site restoration and clean-up, and removal of temporary facilities and equipment from the site.

4.5.2 Equipment and Facility Decontamination

4.5.2.1 Task. All equipment which entered the EZ or contacted contaminated soil, asbestos, or water requires decontamination. This decontamination can only occur at the designated decontamination facilities. Similarly all paved surfaces including decontamination pads which contacted contaminated soils will be rinsed. Support area facilities will receive at minimum a thorough floor wet-mopping. All interior surfaces of the decontamination facility will be wet wiped to remove any visible contamination. An aggressive, clearance air sample will be collected inside the clean area of the decontamination facility to ensure that this area is maintained in a "Clean" condition.

4.5.2.2 Considerations

- Pumps and hoses will be flushed clean utilizing clean water

4.5.3 General Site Restoration and Clean-Up

4.5.3.1 Task. Only areas disturbed outside the access road, authorized haul routes, and paved work areas require restoration. The equipment decontamination pad will be cleaned after final equipment decontamination. Debris, remediation wastes, and soiled protective clothing will be disposed in the debris disposal area, if it has not contacted any asbestos containing materials.

4.5.3.2 Considerations

- Soiled personnel protective equipment, contaminated debris from construction activities, and spent equipment air and oil filters which cannot be cleaned on-site will be disposed in the debris disposal area. 2,

4.5.4 Removal of Temporary Facilities and Equipment From the Site. The disconnection of utilities, removal of temporary fences, project signs and other appurtenances will accommodate the transition to the follow-on contractor.

4.5.5 General Close-Out Items. The following includes items to consider at the time of close-out:

- Closure reports include:
 - a. Safety Report, with outgoing medical examinations.
 - b. Project Close-Out Report.
 - c. Personnel Monitoring Results.
 - d. Asbestos Engineer Inspection Report

5.0 PROJECT SCHEDULE/NETWORK ANALYSIS

5.1 Work Breakdown Structure. The following Work Breakdown Structure (WBS) reduces the project to a set of activities (work packages) with identifiable scopes of work, durations, and budgets. The WBS will be utilized in the preparation of the Construction Schedule. The WBS will also be used in the development of the Progress Estimate format.

<u>WBS Number</u>	<u>Description</u>
001	Notice to Proceed
100	Mobilization
110	Project Setup/Site Preparation
120	Access Road Construction
130	Asbestos Pipe Abatement
140	Asbestos Transportation and Disposal
150	Asbestos Landfill Cover
160	Pipe Stand and Concrete Support Removal
170	Project Complete

5.2 CPM Schedule and Network Analysis. The computer program utilized to prepare the Project Schedule is "SureTrak" by Primavera Systems, Inc. The program is fully compatible with Primavera's P3, Project Planner.

The Project Schedule was developed using the above WBS and the following assumptions:

1. The standard work week will be five (5) each, eight (8) hour days.
2. Activity durations are built around the initial contemplated work scope.

Attachment 2 provides the Preliminary Project Schedule.

6.0 HEALTH AND SAFETY

6.1 General. All activities on this project will be conducted in strict accordance with the Site Safety and Health Plan. All ground crews will wear visible orange vests over Tyvek suits for safety. Additional protective clothing requirements for ~~on-site work outside the exclusion zone~~ include steel toe boots, hard hats, eye protection and coveralls.

6.2 Air Quality Monitoring

6.2.1 Background Air Monitoring. Background air monitoring will be performed from one upwind and one downwind location prior to beginning asbestos abatement. The samples will be collected using Personnel Air Monitors (PAMs). The Contractor will collect three (3) sets of two (2) ambient pre-abatement air samples for a total of six (6) ambient pre-abatement air samples at random locations along the pipe removal area prior to the beginning of the abatement activities. Additional pre-abatement samples will be collected in the permanent site decontamination facility.

6.2.2 Workplace Air Monitoring. Daily air monitoring of the work site will occur similarly to background air monitoring. A total of two samples, one upwind and one downwind, will be collected and analyzed for asbestos every day that asbestos removal work is performed. Periodic monitoring will be conducted in the clean room of the permanent site decontamination facility.

6.2.3 Personnel Air Monitors (PAMs). A total of 25 percent of the work force will wear PAMs for the duration of the shift for collection of an eight hour Time Weighted Average (TWA) asbestos sample. These samples will be collected every day that asbestos removal work is in progress.

Additionally, 30 minute excursion samples will also be collected from the workers with the highest potential for exposure. The excursion samples will be collected in conjunction with the collection of the personnel samples.

Finally, one worker per week will have a single PAM sample collected and analyzed for lead, arsenic, cadmium, and zinc. This sample will be an eight hour TWA sample and will only be obtained once per week.

6.2.4 Reporting Air Monitoring Results. The Contractor will provide all air monitoring results to the client in a Weekly Air Monitoring Report. The report will summarize site work activities and relate air monitoring results for that particular activity. All air monitoring results will be posted at the job site trailer and the employee wearing the PAM will receive a personal letter indicating the analytical results.

6.2.5 Reviewing Air Monitoring Results. The air monitoring results will be reviewed by the Site Health and Safety Officer to determine the impacts to daily operations. If the air monitoring results are consistently less than the action levels (see Section 6.5), the Site Health and Safety Officer may downgrade the level of protection for workers. Conversely, if the action levels are exceeded either upgrading the level of protection or other engineering controls will be implemented to provide adequate worker protection.

6.3 Personnel Protective Equipment (PPE). PPE for project workers will be selected and utilized based upon the existing and potential hazards encountered. The Site Safety and Health Plan provides a description of each level of protection. The following is a listing of preliminary minimum levels of protection required for anticipated project personnel. Minimum levels of protection may be upgraded/downgraded based on the results of air monitoring and exceedence of action levels.

- Level D Operations
Project Setup/Site Preparation

take out -
?

X NO.
to the
previously
stated
minimum
reg'd PPE

a you cannot
downgrade below
level D.

asb. abatement
will be carried
according to
applicable reg's
you cannot
downgrade below
C for asbestos abatement
activities

- Level C Operations
 - Access Road Construction
 - Asbestos Pipe Abatement
 - Pipe Stand Removal and Salvage
 - Concrete Support Removal

6.4 Decontamination Facilities and Procedures. The Contractor will utilize the existing decontamination facilities, including the vehicle and equipment decontamination wash and the decontamination building just inside the east access gate on McKinley Avenue. Gross decontamination, including removal of all protective equipment except the respirator, will occur in a portable decontamination station that will be located in the proximity of the operations. The respirator will be removed after thorough washing in the decontamination building.

At the end of each work period or shift, all personnel will be required to shower thoroughly to decontaminate any potential exposures. Coveralls worn beneath the Tyvek suits will be laundered on-site and will not be available for re-use until washed. Respirators must be cleaned prior to re-use.

All vehicles that enter the site must drive through the vehicle decontamination station prior to leaving the site. All equipment will be rinsed with high pressure water to remove mud. If the possibility exists that contaminated material entered the vehicle, the inside will be vacuumed using a vacuum equipped with a HEPA Filter.

6.5 Action Levels and Responses. The site safety officer may upgrade or downgrade the levels of protection based on variations in site conditions relative to the initial hazard assessment. As information from air monitoring results become available, this information will be used to adjust levels of protection for specific work tasks.

The decision to upgrade the level of protection published in this Work Plan will be made by the Site Safety Officer based upon the prevailing site conditions including exposure, contamination, meteorological conditions and the site operation involved.

A decision to downgrade from a previously established level of protection published in this Work Plan is permitted, when in the professional judgment of the Site Safety Officer site conditions warrant such a downgrade. Where the Site Safety Officer has upgraded the level of protection due to prevailing site conditions, and site conditions return to the pre-upgrade state, the Site Safety Officer is authorized to return to the previously published levels of protection.

The action level for required respiratory protection is 0.15 fibers/cc.

6.6 Work Practices and Procedures. All site personnel will avoid visibly contaminated areas on-site. No eating, drinking, gum, smoking or tobacco chewing will be allowed on-site, except in designated areas. No alcohol will be permitted on-site. Site work will be performed during daylight hours. Employees are to report to the Project Superintendent or site Safety Officer, any symptoms of exposure they might experience and all accidents/incidents.

6.7 Documentation. The Contractor will maintain logs and reports covering the implementation of the Work Plan. These shall include the following:

1. Daily Safety Log
2. Air Monitoring Results Report
3. Daily Safety Meeting Report
4. Instrument Calibration Log

5. Meteorological Data Log
6. Health and Safety Training Records
7. Health and Safety Medical Records
8. Personal Air Monitoring Records
9. Accident/Incident Reports
10. Periodic Safety Reports
11. Close Out Safety Report

The Site Safety Officer will be responsible for generating and maintaining all the above documents. Daily safety briefings will be conducted and recorded on a Daily Safety Meeting Report.

The Instrument Calibration Logs will be maintained on a daily basis. Each instrument on site will have its own calibration log which will include, at the minimum, the following:

- Instrument name
- Serial number
- Appropriate settings (span, gain, type of probe)
- Concentration of calibration gas (as appropriate)
- Instrument response
- Battery condition
- Brief description of any problems or malfunctions
- Initials of calibrator

Copies of training certificates and medical authorization for all personnel will be contained in a bound notebook in the Contractor's field office. The Site Safety Officer will ensure that all personnel are in compliance with the training and medical requirements.

Periodic Safety Reports will be completed by the Site Safety Officer. These reports shall include:

1. Non-use or misuse of protective devices in an area where required
2. Non-use or misuse of protective clothing
3. Disregard of the buddy system
4. Violation of eating, smoking, drinking, or chewing prohibition
5. Job-related injuries and illness
6. Data developed by the meteorological station

*include camp
w/ reg's -*

At the completion of the work, the Site Safety Officer will submit a close-out safety report summarizing the safety performance achieved during the project. Specific elements of the report will include:

- A description of significant events, exposures, accidents, illness, and action taken to prevent their reoccurrence;
- Documentation of final medical exams for all site personnel;
- Procedures for final decontamination of facilities and equipment;
- A summary of all monitoring results including air, stress, and meteorological;
- A plan for maintaining medical and employee exposure records for 30 years;
- A description of any state or federal inspections involving the health and safety of the site workers.

7.0 QUALITY CONTROL PLAN

7.1 General. An independent Quality Control (QC) Plan will not be required for this project. However, the following QC principles will be adhered to by the Contractor.

Inspections. Inspections to be performed by the Contractors personnel will include:

- Review of contract requirements and Work Plan with a report of any discrepancies to the Project Superintendent.
- A check of all required shop drawings and submittal data to ensure proper approval.
- A physical examination of materials and equipment to ensure conformance with approved material specifications and calibration.
- Examination of the work area to ascertain completion of work.

Non-Compliance. When activities or services do not comply with the Work Plan, the following procedures will be employed.

1. Notify Project Superintendent of non-compliance and request suspension of work activity and isolate affected work.
2. Notify owner.
3. Initiate Non-Compliance Report, to open non-compliance case.
4. Determine and implement corrective action.
5. Monitor corrective action and establish preventive action for continued work.
6. Close non-compliance case and properly annotate on the Non-Compliance Report.